

REMARKS

With entry of this amendment, claims 1, 2 and 11 have been cancelled and claims 3-10 and newly presented claim 12 are pending in this application. New Claim 12 is presented reciting the pH as low as three being pH 4.0-4.5. Applicants have amended Claim 3 to recite a process for liquefying starch comprising the steps of providing a mixture of a starch slurry having a pH as low as 3.0 and adding a thermostable, acid-stable alpha-amylase capable of hydrolyzing starch at a pH as low as 3.0, the alpha-amylase cultured from *Bacillus acidocaldarius*; liquefying the starch slurry by heating the mixture until a DE of about 10-12 is reached within 60 to 90 minutes after the addition of the alpha amylase without the production of maltulose; and adding a saccharification enzyme to the liquefied starch slurry from step b) and maintaining a resulting saccharification mixture at about 60° C for between about 10-48 hours or until about a 95% glucose yield is achieved. Support in the specification is at least found in originally filed claim 2, page 12 lines 11 to 29 and page 14, line 10 to page 15, line 6. Applicant submits no new matter has been added in the present invention.

Claim rejections 35 USC § 112

Claims 1 and 2 were rejected under 35 USC § 112, second paragraph as the recitations "low pH" and "suitable for conventional saccharification processes" in Claim 1; and "adversely affect" in claim 2 were asserted to render those claims indefinite. Applicant has cancelled Claims 1 and 2. Applicant requests that the 35 USC § 112 rejection be withdrawn.

Claim rejections 35 USC § 102

Claims 1, 2 and 11 were rejected under 35 USC §102 as being anticipated by JP- 10-136979 (JP '979) and Shetty, et al, respectively. Applicant respectfully requests that the rejection be withdrawn. Applicant has cancelled claims 1, 2 and 11. Applicant requests that the 35 USC § 102 rejection be withdrawn.

Claim rejection 35 USC § 103

Claims 3-11 were rejected under 35 USC § 103 as being unpatentable over Shetty in view of JP10-136979 (JP '79). Applicant submits that the Examiner has not established a prima facie case of obviousness. Applicant submits that there is neither suggestion nor motivation to modify the reference or to combine reference teachings. There is no hint or suggestion in Shetty to utilize a *Bacillus acidocardius* alpha amylase. Shetty describes a new product, GC521, a *Bacillus licheniformis* alpha amylase which produces a starch hydrolysate composition identical to conventional thermostable alpha-amylases currently used in the industries (Shetty, page 12). The new product is described as allowing glucose producers to use a low pH/ low calcium thermostable alpha-amylase from *B. licheniformis* in the liquefaction process (Shetty, page 12). Since Shetty describes the benefits of the new product GC521, Applicant submits that there is no motivation provided within Shetty to use a *B. acidocaldarius* alpha amylase instead.

Applicant also submits that there is no hint or suggestion in JP '79 of making the combination as asserted by the Examiner. KSTM 2037 is described as "stable for 15 minutes in the pH range of 4.5 to 5.0 under heating at 90° C for 15 minutes". The optimal pH for KSTM is described as being between 4.5 to 5.0. Thus in addition to not suggesting the use of the enzyme in the recited as low as 3.0 range, the reference itself teaches away from the use of the KSTM 2037 enzyme in the recited as low as pH 3.0 environment for 60 – 75 minutes

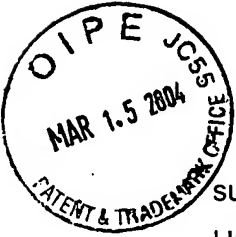
Applicant also submits that there is nothing in the cited documents that would hint or suggest of the ability of KSTM 2037 enzyme to provide a DE of 10-12 within 60-75 minutes after adding the described alpha amylase. Applicant submits that Example 1 of the present application describes the use of *Bacillus licheniformis* derived alpha amylases (an amylase sold under the brandname SPEZYME FRED L), a *Bacillus stearotheromphilus* derived alpha amylase (an amylase sold under the brand name TERMAMYL SC), and the *Bacillus acidocaldarius* (KSTM #2037) under the same environmental conditions. Only the use of the *B. acidocaldarius* provided the desired DE level within 60 to 75 minutes after the application of the same conditions to the various *Bacillus* alpha amylases (page 12, lines 24-30; and Fig. 4). Applicant submits that the inability to produce the liquefact with the desired DE levels

is not an expected nominal difference. Applicant respectfully requests that the 35 USC 103 rejection over Shetty in view of JP 10-136979 be withdrawn.

Double Patenting

Claims 1-11 were provisionally rejected under the judicially created doctrine of obviousness type double patenting as being unpatentable over claims 1-52 of co-pending application no 10/026,288. Applicant respectfully requests that the rejection be withdrawn. The purpose is to prevent the extension of the term of the patent, by prohibiting the issuance of claims in a second patent that are not patentably distinct from those in the first patent. This is so the public can, upon expiration of the first patent be free to practice obvious claimed variations of the invention claims. However, Applicant submits that since the applications were filed on the same day and after June 6, 1994, neither of the patents in question would extend beyond 20 years from the date of filing.

Furthermore, Applicant submits that the scope and/or encompassment of the claims relative to one another may change during the prosecution of the claims of the present application and those of the co-pending application Ser. No. 10/026,288. Therefore Applicant requests that the rejection and requirement of a provisional rejection be withdrawn.



CONCLUSION

Applicants respectfully request entry of the above amendment. Applicants submit that the claims as presently presented render moot the rejections under 35 USC 112, second paragraph; 35 102, 35 USC 103 and the provisional double patenting rejection. Applicant respectfully requests that the rejections based on 35 USC 112, second paragraph; 35 102, 35 USC 103 and the provisional double patenting be withdrawn.

Respectfully submitted,

Date: March 11, 2004

A handwritten signature in black ink, appearing to read "Richard T. Ito".

Richard T. Ito
Registration No. 32,242

Genencor International, Inc.
925 Page Mill Road
Palo Alto, CA 94304
Tel: 650-846-4020
Fax: 650-845-6504